Massachusetts FirstNet Use Cases The Boston Marathon Panel Discussion

Preparing for the Annual Boston
Marathon



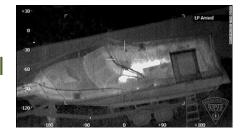
Responding to the Mass Casualty Incident



Conducting the Investigation



Managing the Multijurisdictional Manhunt



Panelists

Peter Clifford

Superintendent, Fire Alarm Division, **Boston Fire Department**

John Daley

Deputy Superintendent and Commander of the Technology Services Division, **Boston Police Department**

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PREPARING FOR THE ANNUAL BOSTON MARATHON

Overview of the Annual Event
Command Structures
Electronic Assets and Tools
Current Wireless Usage

By the Numbers



THE RACE

36,000 registered runners in 2014,



plus **1000s** of unregistered "bandits", including mass transportation to Hopkinton

TRAFFIC CONTROL

26.2 miles on major roads

on a Monday starting in Hopkinton and passing through Ashland, Framingham, Natick, Wellesley, Newton, Brookline, and ending in Boston



CROWD CONTROL

Over **1M** spectators line city streets to watch the marathon

MEDIA

2,200 media credentials, representing **260**

media outlets from over 30 countries



Boston Marathon course

PUBLIC SAFETY

Over **3,500** police officers and **1000s** of other first responders patrol and support





VOLUNTEERS

Over **10,000**volunteers are deployed by the BAA along the Marathon course

Roles and Responsibilities





Boston Athletic Association (BAA)

- Manage 10,000 volunteers
- Provide services to race participants
- Operate medical tents
- Provide transportation, including shuttle buses to starting line



Public Safety Multi-Agency Coordination Center (MACC)

- Maintain situational awareness and a common operating picture
- Manage resource requests and support 8 host cities and towns
- Staffed by 250 representatives of 60+ local, regional, state, federal, private, and volunteer organizations

Over **700** police officers, firefighters, EMTs, and paramedics attended pre-Marathon training and **400** participated in tabletop exercises

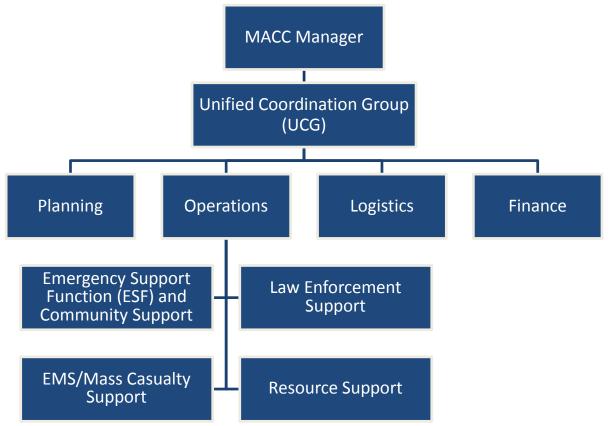
- Prepare for race day
 - Train first responders
 - Produce 2 videos (Roll Call & Volunteer)
 - Conduct tabletop exercises
 - Manage See Something, Say Something public campaign
- Coordinate multi-jurisdictional public safety operations and decision making
 - Interoperable communications
 - Law enforcement tactical operations (SWAT/STOP)
 - Explosive Ordinance Disposal (EOD)
 - Weapons Detection Teams (CBRN)
 - Intelligence and investigation
 - EMS and mass casualty response
 - Course disruption response

Command Structure





Public Safety Multi-Agency Coordination
Center hosted by the Massachusetts
Emergency Management Agency (MEMA)



BAA Race Operations
Center

Emergency Operations
Centers (EOCs)

Command Posts (CPs)

Operations/
Coordination Centers

Mass Casualty Response Command



- Medical preparedness was high following usually hot 2012 Marathon (with 275 people transported to hospitals)
- The **Medical Intelligence Center** at the Boston Public Health Commission was a coordination center for Boston public **health** and healthcare
 - Activates for major events and disasters
 - Shares information across health care providers and responders
 - Information on patients
 - Hospital supply needs
 - Ongoing security updates
 - **Services** available to victims
 - Coordinates critical resources
 - Supports medical surge capabilities for hospitals and health centers



- **Boston Public Health Commission** Department Operations Center
- **Boston Emergency Medical Services Dispatch Operations Center**
 - Coordinates EMS field providers and area hospitals
 - Manages EMS channel usage
 - Provides EMS resource information
 - Offers command and control assistance
- 6 area Level 1 Trauma Centers had their emergency systems activated on race day

Electronic Assets and Tools





Primary platform for information sharing

- Information entered by MACC, EOCs, CPs, and other coordination centers
- 3 WebEOCs are active during the Marathon (MEMA, City of Boston, and DPH)
- Tracks information near course on:
 - Road closures, reopenings
 - Status of local reception centers
 - Activation of command centers
 - Calls to police, fire, and EMS
 - Significant events and issues
 - Potential race disruptions
 - Detours of racers and stoppages
 - Abandoned or suspicious packages
 - Weather conditions
 - Hazardous conditions
 - Threats to public safety
 - Incidents resulting in serious injury and mass casualty incidents



ArcGIS Online

- Prepopulated and real-time GIS data
 - Static layers about the course and host communities, including location and capabilities of medical tents
 - Incidents and events from WebEOC
 - Locations of mobile command posts
 - Locations of escort vehicles
 - Density of runners crossing timing mats
 - Road closures and detours
- Graphic products include:
 - Situation maps
 - Briefing maps
 - Live, interactive web maps
 - Ad hoc maps to support command staff

Electronic Assets and Tools





- Dedicated Interoperable Command Channel
- **Health and Homeland Alert Network (HHAN)**
 - **13,000 users** (public health, hospitals, community health centers, emergency preparedness, and the volunteer Medical Reserve Corps)
 - Share info with **Executive Decision Group**
 - Notify of convening conference calls
- Situational Awareness Statements and Urgent **Matter Reports**
 - Disseminated via **email**
 - Large distribution list

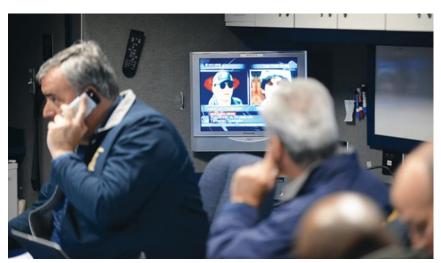
- National Weather Service weather tracking and air hazards detection systems
- Periodic **Briefings** (scheduled and unscheduled using a dedicated conference call bridge)
- **Public Warnings** and Emergency Notifications
 - **Emergency Alert System**
 - **Wireless Emergency Alerts**
 - Massachusetts Alerts app (powered by Ping4alerts!)
 - Traditional media, websites, and social media postings
- **Joint Information Center** connected more than 30 Public Information officers by email

Current Wireless Usage



- Interoperable LMR voice communications
- Text and email communications
- Pager notifications
- HHAN messages
- Remote access to RMS, CAD, and other mission critical systems
- Remote access to WebEOC and incident reporting systems
- Streaming video feeds
- GPS location tracking
- Interactive maps
- Wireless Emergency Alerts
- Massachusetts Alerts app
- Weather and air telemetry







RESPONDING TO THE MASS CASUALTY INCIDENT

Topic 1: Managing the MCI on the Scene

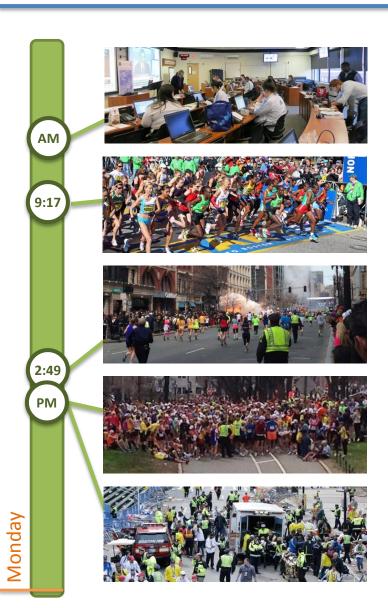
Topic 2: Managing Surge Volume at Hospitals

Topic 3: Identifying Victims and Reuniting Families

Topic 4: Conducting Bomb Disposal Investigations

Marathon Bombing Event Timeline





Monday, April 15, 2013

Early morning – MACC, Boston and other EOCs, Boston MIC, Boston EMS DOC, BPHC DOC, and other command centers activated

9:17 AM – Boston marathon races starts

11:56 AM – Elite runners begin to finish

2:49 PM – Two bombs explode near finish line; 3 people killed and 282 injured, including 14 amputations; Medical Tent A converted to serve as mass triage, trauma unit, and morgue

Afternoon – Command center set up at the Westin Copley Place Hotel, under the lead of the FBI; 12 block area crime scene closed

Afternoon/Evening – Police and others respond to numerous false alarms, including backpacks near bombing site, reports of a bomb at the JFK Library, and a Code Red at the Moakley Courthouse



Topic 1: Managing the MCI on the Scene



"I only wanna hear from the 984... Everyone else stay off the air!"

Boston dispatcher trying to prioritize communications over LMR



Race Day Medical Resources

- 800 medical volunteers & staff
- 26 medical tents, including 10 enhanced tents with ambulance support
- 2 Medical Tents (A and B) with communications,
 100s of cots, laboratory sections, & other
 resources (focused on race-related injuries)
- 16 first aid stations
- 49 hydration stations
- 100 wheelchairs & stretchers pre-positioned
- 3 Disaster Management Admin Teams tents
- Numerous medical buses & ambulances
- Added medical teams positioned after mile 20
- EMTs & Paramedics deployed on bicycles/carts
- Prepositioned MCI trailers at mid-course

Post-Incident Operations

- Medical Tent A transformed into mass triage and trauma unit with morgue
- Volunteers and bystanders became involved in first aid and victim transportation to Medical Tent A
- First responders surged on scene resources
- Boston EMS transported 30 "red tag"
 patients to hospitals within 18 minutes
 and all patients within 45 minutes
- 150 separate HHAN messages were sent to 40,000 devices

Topic 2: Managing Surge Volume at Hospitals





Hospital Surge Trauma Procedures

- Mobilized trauma teams
- Cancelled scheduled surgeries & imaging
- Prepared equipment trays for vascular & orthopedic procedures
- Called orthopedics-manufacturer reps for extra hardware to be mobilized
- Contacted blood banks to secure blood supplies
- Coordinated between EDs for equipment
- Arranged added security as potential secondary targets
- BWH prepared HAZMAT decontamination units

"Massachusetts Hospital Association (MHA) cited WebEOC as the most effective tool during the Boston Marathon bombings to acquire and communicate important data concerning critical needs and resources."

FEMA, "Boston Marathon Bombings:

The Positive Effect of Planning and Preparation on Response"

Post-Incident Operations

- MIC, EMS notified hospitals of mass casualty situation
 - Many learned of event through social media, apps
 - Attacks occurred around shift changes, nearly doubling staff
- Patients distributed among 8 area hospitals
- Incident commander assigned at each hospital
- Identified and conveyed evidence to investigators
- Used WebEOC and HHAN to communicate status, ED needs

Topic 3: Identifying Victims and Reuniting Families



Another huge communication challenge posed by the bombing was identifying who was hurt, keeping track of them once they were hospitalized, and reuniting worried loved ones with their injured family members.

JBJS-JOSPT Special Report, "It Takes a Team," March 2014

Coordinating the Public

- There were 9,000 runners still on the course
- Each runner carries a course location chip
- Tens of thousands of racers, families, and spectators were separated by the chaos
- Many IDs, wallets, and phones were not accessible
- Roads were still blocked off for the race, others cordoned off near the blast site
- Commercial cellular and wireless was overloaded
- Drop in locations were set up to reunite families
- Seaport Hotel donated space for victim services



Identifying Victims

- Many patients were not identified immediately
 - Patients arrived without purses, wallets, or family
 - Near issues with assigning test results and medications to the correct patient
- Influx of patients overwhelmed registration
- Once identified, hospitals shared patient identification with the MIC to locate families

Topic 4: Conducting Bomb Disposal Investigations



Using Specialized Equipment

- Talon robots
- Logos XR200, portable x-ray units
- Total Containment Vessels



Coordinating Bomb Disposal Units

- Local Law Enforcement: Boston & Cambridge PDs
- County Law Enforcement: Suffolk County, NY
- State Police: MA, NH, NY, & CT
- Military: MA Army National Guard (Camp Edwards) and US Navy (from Rhode Island)
- In all, 45 bomb techs and 40 K-9 handlers

"In the week of the Boston
Marathon bombings, the Boston
bomb squad and their partners
went on 196 calls in five days, a
pace to rival the worst of the
Surge in Baghdad."
Wired Magazine, October 25, 2013

Post-Incident Operations

- Dozen bomb techs stationed at the finish line with a call for available bomb techs to deploy
- Required rapid exam, including hand entry
 - o 1000s of abandoned personal items
 - Eight propane tanks in a small car 2 blocks away
 - Car full of fuel canisters in a downtown garage
- "Whac-A-Mole" game of bomb disposal
 - Respond to abandoned vehicles and items; hits from K-9 units; tips from 911 and tip lines
 - Threats at JFK Library and Moakley Courthouse
- Long shifts for bomb tech throughout event
- Disposal of unexploded pipe bombs



CONDUCTING THE INVESTIGATION

Topic 5: Managing Evidence and Leads

Topic 6: Managing Competing Command Needs

Conducting the Investigation *Marathon Bombing Event Timeline*





Tuesday, April 16, 2013

Morning – Victim Jeff Bauman gives description of suspect with backpack; authorities recover mangled parts of exploded device

Afternoon – At police request, the public and local businesses provided huge numbers of **photos and videos** for analysis

Wednesday, April 17, 2013

Afternoon – Several media outlets erroneously report arrest has been made; BPD and FBI deny report; President Obama signs emergency declaration for disaster assistance

Thursday, April 18, 2013

11:00 AM – City holds interfaith service at Cathedral of the Holy Cross with President Obama in attendance Afternoon – President visits victims at Massachusetts General Hospital; First Lady visits victims at Boston Children's and Brigham and Women's Hospitals

Conducting the Investigation Topic 5: Managing Evidence and Leads







Elements of the Investigation

- Victim statement helped focus attention on backpacks
- 2,000+ other leads reported, including 911 and tip lines
- Multiple false reports
- FBI secured a warehouse in Boston's Seaport District
 - Half room to examine hundreds of pieces of collected evidence
 - Half room to sift through hundreds of hours of video and thousands of pictures

Topic 6: Managing Competing Command Needs



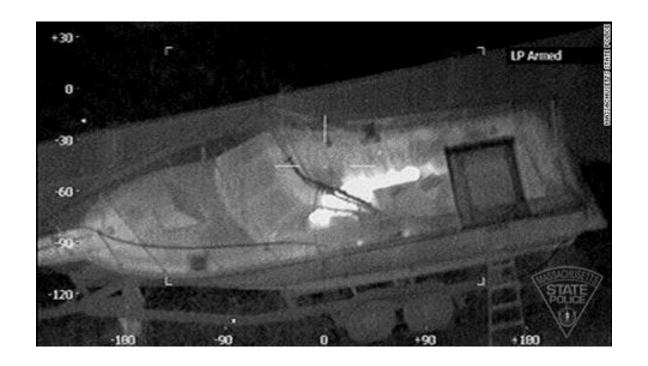
Command and Operation Centers

- MACC at MEMA
- Boston Unified Command Center
- FBI Investigation Command Post at the Westin Copley
- Governor's Situation Center
- Mayors' Situation Centers
- Secret Service Presidential Escort Team
- Watertown Command at the Arsenal Mall
- NEMLEC Command Center
- Medical Intelligence Center at the Boston Public Health Commission
- Boston Public Health Commission Dept Operations Center
- Boston Emergency Medical Services
 Dispatch Operations Center
- MA State Police Command Center
- Boston Fire Department Command Center
- Numerous agency command posts
- Numerous tactical team commands



Post-Incident Command

- Most mobile command centers
 dependent upon AirCards for data
- Mobile command posts set up in close proximity
- Numerous involved agencies, at all levels of government
- Commands may not fully understand how much bandwidth is being used



Managing the Multijurisdictional Manhunt

Topic 7: "Shelter in Place" and Door to Door Search

Topic 8: Enhancing Situational Awareness (Mobile Command)

Managing the Manhunt Marathon Bombing Event Timeline







Fhursday

10:30

Early

AM

6:33

7:30

Friday











Thursday, April 18, 2013

5:00 PM – FBI releases photos of suspects ("black hat" and "white hat")

10:30 PM – Suspects kill MIT Officer Collier; suspects hijack Mercedes SUV and vehicle owner "Danny" and intent to head to NYC to bomb Times Square

Friday, April 19, 2013

12:15 AM – Carjack victim escapes from suspects and asks Mobil station clerk to call 911; **police track suspects** using iPhone and SUV GPS

12:00 to 12:50 AM – Suspects take hijacked SUV and Civic to Watertown; Watertown officer identifies brothers and radios for backup; gunfight ensues, including use of 200-300 rounds, 1 IED, and several "crude grenades"; Tamerlan is shot and hit by Mercedes SUV; MBTA Officer Donohue is shot and critically wounded; Dzhokhar rams police cars and flees by car; police chase suspect and Dzhokhar flees on foot near corner of Spruce and Lincoln

1:35 AM – Tamerlan pronounced dead at Beth Israel Hospital

Early morning – Command center set up at the Arsenal Mall in Watertown

6:33 AM to 6:00 PM – Governor issues **"shelter in place"** advisory for Boston area; **mass transit is shut down**; **reverse 911 calls** ask people to stay indoors

Morning and afternoon – 20 block area of Watertown is cordoned off; police execute door-to-door search; 1,800 officers respond

Between 6:00 PM and 7:00 PM — Outside the search area, Watertown resident finds blood and body in boat in his backyard, calls 911; police reissue "shelter in place" advisory for Watertown residents

7:30 PM – Law enforcement include SWAT team members surround boat and open fire; MSP infrared camera captures image of Tsarnaev in boat; dozens of residents evacuated from area

8:45 PM – Second bombing suspect located on Franklin St and taken into custody and transported to Beth Israel Deaconess Medical Center

Managing the Manhunt Across Jurisdictions





Managing the Manhunt

Topic 7: "Shelter in Place" and Door to Door Search



Elements of the "Shelter in Place"

- Governor's order/request for Watertown and Boston area
- Watertown and Somerville residents received reverse 911 calls
- Use of MA Alerts app and Wireless Emergency Alerts (WEA)
- Public transit, Amtrak, and taxi services suspended
- Major events canceled
- A 20 block area of Watertown was cordoned off for door-to-door searches



Response to the Watertown Gunfight

- 1,800 officers responded; many were "self deployed"
- Many out-of-area officers reported
 navigation issues within Watertown
- "Shelter in Place" decision made in consultation with the Governor and mayors
- Helicopters and SWAT teams aided search
- HHAN delivered another 20,000 pings

Managing the Manhunt

Topic 8: Enhancing Situational Awareness



Electronic Assets

- Mobile command centers and vehicles
- Command and Situational Awareness Tools
 - MEMA's WebEOC
 - MIT Lincoln Laboratories' Next Generation Incident Command System (NICS)
- Agency Operations Support Systems
 - Incident Reporting System
 - Computer Aided Dispatch
 - Records Management Systems
 - 911 call and tip line record systems
 - Forensic Information Systems
- Intelligence Systems
 - Boston Regional Intelligence Center systems
 - Fusion Center systems
- Boston EMS's Central Medical Emergency Direction (CMED) System
- Public Camera Systems/ Video Feeds
- Detection Systems
 - Shot detection systems
 - NWS air hazard detection systems
- Traffic control systems
- Photo/video analysis tools (facial recognition)

"They're shooting at us! They are throwing grenades at us! They threw a bomb at us out a window!"

Watertown Police Radio Communication

Current Wireless Usage in Mobile Command Centers

- Dedicated voice communications channels
- Cellular calls
- Text messaging and email
- Pager notifications and HHAN messages
- GPS locations and internet tools
- Access to some agency systems, criminal justice inquiries
- Streaming video feeds

PSBO
Public Safety
Broadband Office

The PSBO **identified 73 potential needs** based on the Boston Marathon to be considered in planning and designing the NPSBN. These are included at the end of the Boston Marathon Case Study document.

- Establishment of ReliableCommunications (Capacity and Coverage)
- Expanded Wireless Video and Telemetry
- Access to Mission Critical Systems
- Improved Field Incident Reporting
- Enhanced Tools in the Field
- Improved Tools to Manage ResourceAssignments
- Tools to Manage Cross Jurisdictional
 Response and Tactical Teams
- Improved Tools to Manage Grid Searches and Tactical Teams

- Better Support for Mobile Command
 Centers
- Shared Situational Awareness
- Improved, Shared Maps
- Integration with Next Generation 911
- Improved Victim Identification and Tracking
- Enhanced Emergency DepartmentSupport Tools
- Inclusion of Temporary First Responders
- Reliable Public Communications
- Better Options for Managing Equipment